

1. (Currently Amended) An apparatus for treating atrioventricular valve regurgitation, comprising:

a cutting instrument ~~for severing~~ configured to sever at least one chord attaching an atrioventricular leaflet to a internal cardiac muscle; and

a positioning catheter configured to position ~~through which~~ the cutting instrument ~~is positioned~~ proximate the at least one chord,

wherein the catheter ~~including~~ comprises an opening through which the cutting instrument can be provided to sever ~~severs~~ the at least one chord.

2. (Currently Amended) The apparatus of claim 1, wherein the cutting instrument comprises a blade having a cutting edge diameter ~~approximating~~ that is approximately the same size as the diameter of the at least one chord.

3. (Currently Amended) The apparatus of claim 1, wherein the cutting instrument comprises an optical fiber ~~for delivering~~ configured to deliver ablative laser energy.

4. (Original) The apparatus of claim 1, wherein the cutting instrument comprises a radiofrequency electrode.

5. (Currently Amended) The apparatus of claim 1, wherein the catheter has comprises a curved end ~~suitable~~ configured to allow engagement of at least one further chords attached to a posterior leaflet.

6. (Currently Amended) The apparatus of claim 1, wherein the catheter ~~includes~~ comprises a steerable tip.

7. (Currently Amended) The apparatus of claim 6, wherein the catheter further comprises a plurality of coaxial steering wires ~~for steering~~ configured to steer the catheter tip.

8. (Currently Amended) The apparatus of claim 1, wherein the cutting instrument is reversibly extendable through the opening, and the opening being is located at the an end of the catheter proximate the at least one chord.
9. (Currently Amended) The apparatus of claim 1, wherein the opening comprises a notch in the catheter, and wherein the notch has having a cross-sectional notch area greater than the cross-sectional area of the at least one chord.
10. (Currently Amended) The apparatus of claim 9, wherein the notch ~~includes~~ comprises at least one protruding edge defining a portion of the notch ~~for limiting that is~~ configured to limit motion of the at least one chord when the at least one chord is positioned within the notch.
11. (Currently Amended) The apparatus of claim 1, wherein the cutting instrument further comprises ~~a means for grasping~~ a grasping arrangement configured to grasp the at least one chord.
12. (Currently Amended) The apparatus of claim 11, wherein the ~~means~~ grasping arrangement comprises a wire having a deformed end ~~for~~ that is configured to at least partially encompassing the at least one chord.
13. (Currently Amended) The apparatus of claim 12, wherein the wire ~~is composed of~~ comprises a shape memory material that ~~deforms~~ is configured to at least partially deform at or near body temperature.
14. (Currently Amended) The apparatus of claim 11, wherein the grasping ~~means~~ arrangement is reversibly extendable through the opening, and wherein the opening ~~is~~ being located at the an end of the catheter proximate the at least one chord, ~~so as~~ and is configured to retract a the at least one grasped chord toward the opening.

15. (Currently Amended) The apparatus of claim 1, further comprising a ~~pair~~ plurality of operable jaws disposed at the an end of the positioning catheter proximate the at least one chord, wherein the jaws are configured to grasp ~~for grasping~~ the at least one chord.

16. (Currently Amended) The apparatus of claim 1, further comprising a ~~pair~~ plurality of pivoting pincers disposed at the an end of the positioning catheter proximate the at least one chord, wherein the pincers are configured to pinion ~~for pinioning~~ the at least one chord in a closed position.

17. (Currently Amended) The apparatus of claim 1, further comprising an introducer catheter ~~for advancing~~ configured to advance the positioning catheter toward the at least one chord.

18. (Currently Amended) The apparatus of claim 17, wherein the introducer catheter further comprises a directing arm ~~through which~~ configured to direct the positioning catheter ~~is maneuvered to the~~ to a position proximate the at least one chord.

19. (Currently Amended) The apparatus of claim 17, wherein the introducer catheter further comprises ~~a means for~~ a stabilizing arrangement configured to at least temporarily stabilize the stabilize a position of the introducer catheter within the LV a left ventricle.

20. (Currently Amended) The apparatus of claim 19, wherein the ~~stabilization means~~ stabilizing arrangement comprises: ~~one or more~~ at least one contact elements reversibly extendable from the introducer catheter, and wherein the at least one contact element is configured ~~so as to~~ contact an internal surface of the a heart cavity at ~~one or more~~ points at least one location.

21. (Currently Amended) The apparatus of claim 20, wherein the at least one contact element ~~is composed of~~ comprises a shape memory elastic material that ~~assumes the~~

~~shape desired~~ is configured to assume a desired shape upon extension of the at least one contact element from the introducer catheter.

22. (Currently Amended) The apparatus of claim 17, further comprising an ultrasound transducer ~~for imaging~~ configured to image a region proximate the at least one chord ~~located on the introducer catheter.~~

23. (Currently Amended) The apparatus of claim 17, wherein the positioning catheter protrudes from within the introducer catheter through an opening in the introducer catheter; and further comprising a plurality of positioning wires ~~similarly~~ disposed within and protruding from the introducer catheter, and wherein the plurality of positioning wires are attached to the positioning catheter so as to enable steering of and are configured to steer the end of the positioning catheter by ~~selectively tensioning on one or more~~ providing tension to at least one of the plurality of the positioning wires.

24. (Currently Amended) The apparatus of claim 17, wherein the introducer catheter further comprises an imaging device ~~oriented so as~~ configured to image a region near the mitral valve, and wherein the region includes ~~including~~ the at least one chord

25. (Currently Amended) The apparatus of claim 24, wherein the imaging device is ~~comprised of a~~ comprises an imager selected from the group consisting of: which further comprises at least one of (i) a two-dimensional matrix array of piezoelectric crystals, (ii) a linear phased array and means for rotating a rotating arrangement configured to rotate the array within the catheter so as to produce a three-dimensional image, a magnetic resonance coil, ~~and or~~ or (iii) a fiber optics arrangement configured to at least one of transmit or receive ~~for transmitting and receiving~~ near infrared energy.

26. (Currently Amended) A Mmethod of for treating atrioventricular valve regurgitation related to restricted leaflet closure by leaflet tethering, comprising the step of: percutaneously severing at least one chord attaching an atrioventricular leaflet to an internal cardiac muscle.

27. (Currently Amended) The method of claim 26, further comprising ~~step of:~~ grasping the at least one chord prior to the severing step.

28. (Original) The method of claim 26, wherein the at least one chord is a basal chord.

29. (Currently Amended) The method of claim 26, wherein the at least one chord comprises at least two chords, ~~wherein~~ a first one of the at least two chords attaches coupling to an anterior leaflet, and a second one of the at least two chords attaches coupling to a posterior leaflet.

30. (Currently Amended) The method of claim 26, wherein the at least one chord comprises a ~~pair~~ plurality of chords.

31. (Currently Amended) The method of claim 30, wherein the ~~pair~~ plurality of chords comprises two chords of attached to an anterior leaflet closest to the a central axis of the a ventricle.

32. (Original) The method of claim 26, further comprising the step of: positioning a cutting device proximate the at least one chord via a catheter.

33. (Currently Amended) The method of claim 32, wherein the ~~positioning step~~ includes cutting device is positioned by advancing the cutting device via a pathway ~~selected from the group consisting of:~~ which includes at least one of a retrograde pathway via the an aterial system into the a left ventricle, a pathway through the a venous system and a right atrium into the a left atrium across the an atrial septum, a pathway directly through a wall of the a heart, and or a pathway which passes percutaneously through a small incision in the a chest wall and a pericardium.

34. (Currently Amended) The method of claim 32, wherein the ~~advancing step is assisted through the percutaneous use of~~ cutting device is advanced using robotic tools provided through a percutaneous pathway.

35. (Currently Amended) The method of claim 26, further comprising ~~steps of: the step of~~ imaging a cardiac region including the at least one chord prior to and during the severing process step, wherein the cardiac region includes the at least one chord.

36. (Currently Amended) The method of claim 35, wherein the ~~imaging comprises~~ cardiac region is imaged by directing ~~transducing~~ ultrasound energy to the cardiac region.

37. (Currently Amended) The method of claim 36, wherein the ultrasound energy is ~~transduced~~ directed from at least one of a ~~the~~ chest surface, an esophagus, or within the a heart.

38. (Currently Amended) The method of claim 37, wherein the ultrasound energy is ~~transduced~~ from within the heart and is provided by an ultrasound transducer positioned proximate the at least one chord.

39. (Currently Amended) The method of claim 35, wherein the ~~imaging comprises~~ cardiac region is imaged optically ~~imaging the region through~~ using at least one or more optical fibers.

40. (Currently Amended) The method of claim 35, wherein an ultrasound transducer is ~~similarly~~ positioned proximate the at least one chord.

41. (Currently Amended) An apparatus for treating atrioventricular valve regurgitation, comprising:

an instrument ~~for elongating~~ configured to elongate at least one chord
attaching an atrioventricular leaflet to an internal cardiac muscle; and

~~a means for delivering a delivery arrangement configured to deliver the~~
instrument proximate the at least one chord.

42. (Currently Amended) The apparatus of claim 41, wherein the instrument further comprises:

two nodes;

at least one length of artificial chordal material connecting the two nodes;

~~means for affixing an affixing arrangement configured to affix each of the~~
two nodes at a respective predetermined position along the at least one chord; and

~~means for severing a severing arrangement configured to sever a~~
segment of the at least one chord between the two affixed nodes.

43. (Currently Amended) The apparatus of claim 44 ~~42~~, further comprising ~~means for~~
~~adjusting an adjusting arrangement configured to adjust~~ the at least one length of
artificial chordal material.

44. (Currently Amended) The apparatus of claim 42, wherein the ~~means for severing~~
~~arrangement~~ comprises a ~~means selected from the group consisting of at least one of a~~
radiofrequency electrode(s), a blades, or an optical fibers delivering configured to
deliver ablative laser energy.

45. (Currently Amended) The apparatus of claim 42, wherein each node comprises: a
first mateable part and a second mateable part; and each mateable part having
comprises a recess for receiving a portion of the at least one chord; wherein the ~~means~~
~~for affixing arrangement~~ ~~each node~~ comprises a mechanism for attaching the first
mateable part to the second mateable part, ~~selected from the group consisting wherein~~
the mechanism further comprises at least one of an adhesive applied to at least a
portion of one surfaces of the at least one mateable parts, a plurality of connecting pegs
and a plurality of holes disposed at corresponding locations on the mateable parts, and
or a heating element configured to anneal together the mateable parts.

46. (Currently Amended) The apparatus of claim 41, wherein: the instrument further comprises:

two nodes, wherein each node comprised of comprises two mateable parts and each having of the mateable parts comprises a recess for receiving configured to receive a portion of the at least one chord;

at least one predetermined length of artificial chordal material connecting the two nodes;

~~means for an affixing arrangement configured to affix each of the two nodes~~ at a respective predetermined position along the at least one chord;

~~means for a severing arrangement configured to sever a segment of the at least one chord between the two affixed nodes,~~

and wherein ~~each node;~~ and the ~~delivering means~~ delivery arrangement comprises:

~~two a plurality of jaws, wherein each of the jaws housing houses a corresponding one of the two mateable parts of associated with each of the two nodes and at least one of the jaws housing houses at least a portion of the at least one predetermined length of artificial chordal material;~~

a controllable hinge mechanism ~~from which the~~ rotatably connected to each of the two jaws; pivot, and

a catheter through which each of the jaws, the controllable hinge mechanism and the instrument are capable of being advanced to a position proximate the at least one chord.

47. (Currently Amended) A method for treating atrioventricular valve regurgitation related to restricted leaflet closure by leaflet tethering, comprising the steps of: elongating at least one chord attaching an atrioventricular valve leaflet to an internal cardiac muscle.

48. (Currently Amended) The method of claim 47, wherein the at least one chord is elongated by elongating step ~~further comprises the steps of:~~

delivering ~~two~~ a plurality of nodes to two positions proximate the least one chord, wherein the nodes ~~being~~ are connected to each other by a at least one length of artificial chordal material;

securing the ~~two~~ nodes to the at least one chord; and

severing the at least one chord at a ~~position~~ location between the ~~two~~ nodes.

49. (Currently Amended) The method of claim 48, further comprising ~~the step of~~ adjusting the at least one length of artificial chordal material.

50. (Currently Amended) The method of claim 48, wherein the ~~severing step further comprises~~ at least one chord is severed by applying radiofrequency energy to the at least one chord at the location between the ~~two~~ nodes.

51. (Currently Amended) The method of claim 48, wherein the ~~step of securing each node further comprises the steps of~~ nodes are secured by:

enclosing a portion of the at least one chord between a first mateable part and a second mateable part of associated with each node; and

adhering the first part to the second part of associated with each node.

52. (Currently Amended) The method of claim 51, wherein the ~~adhering step comprises~~ first part is adhered by applying heat to anneal the surfaces of the first and second mateable parts of associated with each node.

53. (Currently Amended) The method of claim 51, wherein the ~~adhering step comprises~~ first part is adhered by curing an adhesive applied to the at least a portion of a surface surfaces of at least one of the first and second mateable parts of associated with each node.

54. (Currently Amended) The method of claim 51, wherein the ~~adhering step comprises~~ first part is adhered by pressing the ~~two~~ first and second mateable parts of

associated with each node together so as to interconnect pegs and holes provided at corresponding locations on each a surface of each of the first and second mateable parts.

55. (Currently Amended) The method of claim 47 ~~48~~, wherein the ~~delivering step~~ further ~~comprises the steps of~~ nodes are delivered by:

advancing a hinged housing containing the two nodes through an introducer catheter ~~by an approach selected from the list consisting of:~~ via a pathway which includes at least one of a retrograde pathway via the an arterial system into the a left ventricle, a pathway through the a venous system and a right atrium into the a left atrium across the an atrial septum, a pathway directly through a wall of the a heart, and or a pathway which passes percutaneously through a small incision in the a chest wall and a pericardium.